Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period:\_\_\_\_\_\_\_\_\_\_\_

Out of 52 Points.

Forces Quiz

Read each question carefully and answer to the best of your abilities. “May the force be with you!”

Fill-ins: (1 point each)

1. The force with opposes motion is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Forces which are opposite and equal in magnitude are called \_\_\_\_\_\_\_\_\_\_\_\_\_ forces.
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the attractive force between all objects in the universe.
4. As the distance between two massive objects increases, the force of gravity will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. An object's \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ won’t affect the acceleration of the object due to gravity on earth.

SHORT ANSWER ESSAYS: Include as much detail as possible, and use complete sentences.

1. Sand is often thrown on icy walkways to prevent people from slipping. Explain how the sand is helpful. (2)
2. Imagine that you are on the roof of Pier Middle School and drop a baseball, a bowling ball, and a cannonball from a height of about 100 feet. Write a prediction to describe which you think will land first. Explain this concept completely, using vocabulary that we learned in class. (3)
3. Now imagine that you did this test again, but this time, you dropped a feather with the three balls. Write a prediction describing what you think will happen this time and WHY. Remember to use vocabulary that we have learned in class. (3)
4. Imagine that you are trying to push your friend in a box. Describe what kind of friction is created between the ground and the box. Now describe a type of friction that you could change this into to make it easier to push your friend. What would you do to change the type of friction between the box and the ground? (3)
5. You have been hired by Toyota to design a new car. Use the following words to describe how you would design the car to be fast: Mass, Aerodynamic Design, Air Resistance, Friction, and Velocity. Think about the three big labs we have done to help with your ideas. (3)
6. You are sitting on the front handle bar of a bicycle while your friend is pedaling. Your friend sees a cat crossing the road and stops short. Where will you land and why?(3)

MATH PROBLEMS- USING VECTORS

1. Jack and Dan are playing Tug-o-War against Maddie Cote and Leah Benz. The boys pull on the rope with a force of 8 N, while the girls pull on the rope with a force of 10 N. Use vectors to show this scenario and determine who won the Tug-O-War. (3)
2. Riley and Brad West are riding in the car with Mrs. Chapman. The car gets stuck in the snow and the boys have to push it out. Riley pushes on the car with a force of 12 N, and Brad pushes in the same direction with a force of 5 N. Use vectors to show this scenario and determine how much total force is pushing the car. (3)
3. Liam and Ethan are arm wrestling. Describe a situation using vectors to show the boys in a “stale mate” where neither is winning the arm wrestling match. (3)

True and False (1 point each)

1. \_\_\_\_ Sir Isaac Newton was an Italian Chemist.
2. \_\_\_\_ Decreasing the mass of an object would increase its speed on a flat road.
3. \_\_\_\_ Increasing the mass of an object would increase its falling rate.
4. \_\_\_\_ A lubricant increases the amount of frictional force.
5. \_\_\_\_ If someone were to jump up in the aisle of a train moving at 350 km/hr, they would land in the same spot that they jumped from.
6. \_\_\_\_ Unbalanced forces are always equal and opposite in direction.
7. \_\_\_\_ The size of the force of gravity depends upon the masses of the objects and the distance between them.

NEWTON’S LAWS OF MOTION: Below you will find 6 different scenarios that describe one of the three laws of motion. Place the number of the Law it is describing next to the appropriate description. (ie. Write “1” for Newton’s First Law) (1 point each)

1. \_\_\_\_ A baseball is thrown in space and it keeps going and going.
2. \_\_\_\_ Flinging a ‘Hornet’ across Mrs. Loomis’s classroom.
3. \_\_\_\_ A car accelerating down hill
4. \_\_\_\_ A planet orbiting the sun
5. \_\_\_\_ Jerking forward when your car makes a sudden stop
6. \_\_\_\_ Decreasing the mass in a wheelbarrow so you can push it faster

TYPES OF FRICTION: Below you will find 8 examples of friction. Next to each, place the first letter of the type of friction it is describing. S=Sliding Friction, R= Rolling Friction, and F=Fluid Friction. (1 point each)

1. \_\_\_\_ Ice Skating
2. \_\_\_\_ Slipping on a banana
3. \_\_\_\_ Skate Boarding
4. \_\_\_\_ Pushing a Box
5. \_\_\_\_ Swimming
6. \_\_\_ A Plane Flying
7. \_\_\_\_ Pushing a chair out from your desk
8. \_\_\_\_ Riding your bicycle